

Title (en)
Enzymes and detergent compositions

Title (de)
Enzyme und Waschmittelzusammensetzungen

Title (fr)
Enzymes et compositions de détergents

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Abstract (en)
[origin: WO9100345A1] Enzymes produced by mutating the genes for a number of subtilisin proteases and expressing the mutated genes in suitable hosts are presented. The mutated enzymes have a changed net electrostatic charge compared to the parent protease at the same pH. The enzymes exhibit improved wash performance in comparison to their wild type parent enzymes. The enzymes are well-suited for use in detergent compositions.

IPC 8 full level
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Citation (search report)

- [X] US 4760025 A 19880726 - ESTELL DAVID A [US], et al
- [X] WO 8705050 A1 19870827 - GENEX CORP [US]
- [X] WO 8808033 A1 19881020 - AMGEN INC [US]
- [PA] WO 8909819 A1 19891019 - GENEX CORP [US]
- [PA] WO 8909830 A1 19891019 - GENEX CORP [US]
- [PA] WO 8906279 A1 19890713 - NOVO INDUSTRI AS [DK]
- [X] ALAN J. RUSSELL ET AL.: "Electrostatic effects on modification of charged groups in the active site cleft of subtilisin by protein engineering", J. MOL. BIOL., vol. 193, 1987, London, pages 803 - 813, XP002900491
- [X] ALAN J. RUSSELL ET AL.: "Rational modification of enzyme catalysis by engineering surface charge", NATURE, vol. 328, 6 August 1987 (1987-08-06), pages 496 - 500, XP000887130
- [X] WELLS J ET AL: "DESIGNING SUBSTRATE SPECIFICITY BY PROTEIN ENGINEERING OF ELECTROSTATIC INTERACTIONS", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 84, 1 March 1987 (1987-03-01), pages 1219 - 1223, XP002008735, ISSN: 0027-8424
- [X] WELLS J A ET AL: "SUBTILISIN- AN ENZYME DESIGNED TO BE ENGINEERED", TRENDS IN BIOCHEMICAL SCIENCES, ELSEVIER SCIENCE PUBLISHERS BV., AMSTERDAM, NL, vol. 13, August 1988 (1988-08-01), pages 291 - 297, XP002027478, ISSN: 0376-5067

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